Index

Nuclear Safety

Volume 5

Note: The page range for each of the four issues of Vol. 5 is as follows: No. 1, pages 1 to 138; No. 2, pages 139 to 219; No. 3, 221 to 285; and No. 4, pages 287 to 422.

A

Accelerators, radiation monitoring, 193-4
  Van de Graaff generator siting, 24
Accidents, 410
  See also Damage
  Alize I reactor, 172-3
  energy release from molten U in fast reactors, 236-7
  fission-product release in reactor, 389-92
  fuel meltdown in EBR-II, 237
  graphite Wigner energy release, 336-8
  HTRE-3, 172
  I in reactor, 255, 261
  metal-water reactions in SL-1, 54, 392
  ORR fuel failure, 203-7
  power reactors, 1-13
  reactor siting aspects, 223-4
  shipping of radioactive materials, 123-7
  waste disposal, 298, 300
Advisory Committee on Reactor Safeguards, AEC nuclear safety program review, 200-2
  N.S. *Savannah* safeguard review, 146-9
Aerosols, monitors for alpha-emitting, 194-5
  NaCl, development and application, 254
  physical characteristics, 252
  research in UKAEA, 254
Aerospace
  See Space
Agriculture, fission-product release effects, 26-7
Air
  See also Atmosphere and Particles
  cleaning, 146-7, 250-4, 258-60
  contamination in milling and mining, 316-21
  contamination of reactor-coolant, 294
  sampling for I radioisotopes in DIDO and PLUTO containment vessels, 256-8
  tritium determination in, 402
Alarm systems, criticality, gaseous diffusion plants, 170-2
Algae, heavy-water uptake, 196
^{32}P uptake, 197
Alkali metals (molten), handling, 362-3
Alkyl iodides, filtration, 253
Alpha particles
  See Radiation (alpha)
Alumina, reaction with graphite, 49
Aluminum, decay-heat generation in reactor shutdown, 42
  reaction with water, 51, 53-4
Aluminum-nickel-uranium alloys, reactions with water, 54
Ammonia, heat transfer, 165
Animals, radioisotope elimination, 265-7
Apollo Project, radiation tolerances, 20
Aquatic organisms, radioisotope uptake, 196-8
Arco, Idaho, atmospheric diffusion, 403-5
Argonne National Laboratory, glove-box fire and explosion tests, 90
  test-cell filtering system, 251
Arkansas, materials regulation, 217
Arthropods, Sr and ^{65}Zn elimination, 266
Atmosphere
  See also Air and Particles
  alpha-radiation monitoring, 194-5
  behavior, 95-7
  diffusion in, 184-92, 403-7
  fallout in, 95-104
  inversion, 185, 188-9
  meteorological studies, 253-4
  mixing depths, 189-90
  radiation monitoring at NRTS, 26
  radioactive gas disposal into, 253-4
  stagnation, 188-9
Atomic Energy Commission, nuclear safety program coordination, 200-3
  radiation exposure of personnel, 410
  reactor siting, 223-4
Atomic Energy Commission contractors, radiation exposure of personnel, 410
Atomic Energy Commission Division of Licensing and Regulation, N.S. *Savannah* safeguard review, 146-9
Atomic Industrial Forum, activities, 200, 202-3
  reactor siting, 224-5
Atomic Safety and Licensing Board, N.S. *Savannah* safeguard review, 146-9

B

Beryl, toxicity, 34
Beryllia, reaction with graphite, 49
Beryllium, toxicity, 31-6
Beryllium compounds, toxicity, 34
Bibliographies, burnout, 165
Biology, radioisotope elimination, 265-7
Burnout
  See Reactors
Burnup, effects on fission-product release from UO_2, 358-60
By-product materials
  See Materials (by-product)

C

Caddis fly larvae, ^{32}P uptake, 197
Calcium fluorides, use in thermoluminescent dosimeters, 195
Calpoke, energy-source detonation-velocity measurement using, 180-1
Cancer, radiation-induced, 316-21
Cape Kennedy, Florida, atmospheric diffusion, 403-4
  nuclear rocket launching, 314-15
Carbon dioxide, contamination of reactor-coolant, 292, 294
  reaction with graphite, 48-9
Carbon monoxide, allowable exposure levels, 228
Cerium, retention by sand, 262
Cesium, elimination from grasshoppers, 266
  sorption reactions with soil minerals, 262-5
  uptake by aquatic organisms, 198
Cesium (molten), handling, 362
Cesium-134, elimination from mammals, 266
Cesium-137, body burdens in mammals in White Oak Lake bed, 267
  elimination from mammals, 266
  fallout data, 323-4
  filtration, 252-3
  retention in fish tissues, 266
Cesium-138, release in ORR fuel-failure incident, 205
Cesium radioisotopes, release from reactor fuels, 252
Chalk River, disposal of radioactive wastes in sand, 262-3
Charcoal (activated), I filtration from gas systems using, 253
  I-radioisotope filtration at HAPO using, 252
China, signing of IAEA nuclear damage civil liability convention, 222
Chlorite, Cs sorption, 264-5
Chromel, pool-boiling burnout, 49
Clams, ^{90}Sr uptake, 197
Clay, Cs sorption by minerals, 263-4
Clean rooms
  See White rooms
Cleaning
  See also Decontamination and Filtration
  air, 250-4
Clothing, protective, in contamination zones, 104-9
Cobalt-60, body burdens in mammals in White Oak Lake bed, 267
Codes, EBR-II type fuel meltdown, heat-transfer aspects, 236
Colombia, signing of IAEA nuclear damage civil liability convention, 222
Computers, KEWB programs, 45
  MSRE transient analysis, 157
  power-reactor control, 62-3
  Rover reactor transients, codes for, 311-12

Computers (Continued)
transient analysis in MSRE, 157
ventilation evaluation, 251
Xe instability study, 349-51
Concrete, fracturing, 176
reactor pressure vessels, 343-4
Containment, fission-product release studies at HAPO, 255
radioactivity, 253
Transuranium Processing Plant, 251
Contamination
See also Decontamination and Pollution
air in milling and mining, 316-21
clothing for protection from, 104-9
reactor coolants, 291-2, 294
Cosmic radiation
See Radiation (cosmic)
Criticality, control of Pu, 395-6
monitoring in gaseous diffusion plants, 169-72
Cryogenics, burnout with fluids, 51
graphite, irradiated, 336
H-handling hazards, 85-7
Cyclones, waste-incinerator effluent cleaning, 252

D

Damage
See also Accidents
IAEA convention on civil liability for nuclear, 221-3
Decontamination
See also Cleaning, Contamination, and Filtration
^{127}I vapor applications, 260
radiation level control in pressurized-water reactors, 47
Dioctylphthalate, in-place filter testing using, 250
Diseases, Be, 31-6
Dogs, ^{137}Cs elimination, 266
Dosimetry, 192-6
Dugway, Utah, atmospheric diffusion, 403-4
Dust
See Particles
Dynamics (fluid), fog-cooled reactors, 164

E

Economics, air-cleaning equipment, 252
reactor safeguards, 139-45
reactor sites, 142, 145
Eductors, use of Quickdraft, 252
Electromagnetic radiation
See Radiation (electromagnetic)
Electrostatic precipitators, waste-incinerator effluent cleaning, 252
Ethylene glycol, friction properties and heat transfer of flowing, 164
Eurochemic Company, Pu handling, 394-6
European Nuclear Energy Agency, Civil Liability Agreement, 223
Exhausts (fume hood), particle filters, 254
Explosions
See also Nuclear explosions
glove boxes, 89-90
H, 84, 86
H-O in KEWB, 44
Saturn C-5, 314

F

Fabrication (re-), Th-^{233}U reactor fuels, 382-3, 387-9
Fallout, 95-104
Federal Radiation Council report, 323-5
Federal Radiation Council, report, 323-5
Feed materials, waste disposal from processing plants, 290
Felt, shock-absorbing properties, 181-2
Fiber glass, shock-absorbing properties, 181-2
Filters, 141, 250-2, 254, 258-60
Filtration
See also Cleaning and Decontamination
air, 250-2, 254, 258-60
alkyl iodides, 253
^{137}Cs, 252-3
glove boxes, 88
I, 28, 252-3, 256-8
radiation level control in pressurized-water reactors, 47
respiratory-protection equipment, 107-9
^{90}Sr, 252-3
^{132}Te, 252-3
Waste Calcination Facility off-gases at NRTS, 251-2
Fires, control of Pu, 395
glove boxes, 89-90
molten metals, 361-2
Fish, ^{137}Cs retention, 266
^{32}P uptake, 197
^{90}Sr uptake, 197-8
Fission, rate effect on fission-product release from UO_2, 357-8
Fission products
See also Fallout, Radioisotopes, and Waste disposal
atmospheric diffusion, 403-4
containment in reactors, 75-84
decay power in reactor shutdown, 40-1
detection of, from failed reactor fuels, 63-4
energy release in reactor shutdown, 40-1
movement in soil at NRTS, 26
reactor stack-gas-inhalation radiation dosage, 28
release, to coolant in pressurized-water reactors, 46
of gaseous, into ventilation systems, 252
from irradiated U, 252
from irradiated UO_2, 356-60
from ORR, 204-5, 391
in reactor accidents, 389-92
in reactor containment vessels, 254-5
from SL-1, 26, 391
from SPERT-I, 26, 391
release effects, 24-8, 399-407
tracers for nuclear explosions, 102-4
Fissium-uranium alloys (irradiated), ignition, 361
Florida
See also Cape Kennedy, Florida
regulatory authority, 284
Fluids, burnout with cryogenic, 51
dynamics in fog-cooled reactors, 164
Fluorides, use in thermoluminescent dosimeters, 195
Fluorine radioisotopes, discharge from water-cooled reactors, 291
France, Chinon Reactor siting, 23
Fume hood exhausts, particle filters, 254

G

Gamma radiation
See Radiation (gamma)
Gaseous diffusion plants, criticality monitoring, 169-72
waste disposal, 290
Gases, cleaning, 254
cleaning of off-, at NRTS Waste Calcination Facility, 251-2
determination of form of radioactivity in, 252
disposal of radioactive, into atmosphere, 253-4
I removal from systems of, 253
reactions with metals, 360-3
release of radioactive, into ventilation systems, 252
Geohydrology, NRTS, 111
siting of reactors and research centers, 27
waste disposal, 109-13
Geology, waste disposal, 109-13
Geophysics, waste disposal, 111
Glove boxes, 87-91
Goodyear Atomic Corporation, criticality monitoring, 169, 171-2
Graphite, chemical reactions, 47-9
Wigner energy release, 336-8
Grasshoppers, Cs and Sr elimination, 266

H

Hanford Atomic Products Operation, atmospheric diffusion, 403-7
fission-product release studies, 255
I-radioisotope filtering using activated charcoal, 252
Pu criticality control, 396
tritium in fuel-processing waste, 400-2
waste disposal from fuel processing, 295-6, 300-1
Harwell, England, glove-box fire and explosion tests, 90
Health
See also Toxicology
hazards, from power stations, 327-30
from Th handling, 386
Heat transfer, ammonia, 165
deterioration during boiling in tubes, 163-4
EBR-II type fuel meltdown, 236
ethylene glycol, flowing, 164
fog-cooled reactors, 164
subcooled forced-convection boiling, coefficients for, 165
Heavy water, uptake by algae, 196
Helium, contamination of reactor-coolant, 294
nucleate-boiling heat flux, 51
Hood exhausts (fume), particle filters, 254
Human beings, Be toxicity, 31-6
clothing for, in contamination zones, 104-9
^{137}Cs elimination, 266
^{131}I uptake, 254
mutation, 228
Pu-radioisotope internal deposition, 379-80
Pu toxicity, 393
radiation exposure, 24-8, 31, 123, 380-2, 410
radiation hazards, 226-8, 316-21, 325-32, 378-89
radiation monitoring, 192-6, 266, 396
radiation tolerances, 20-2
radioisotope elimination, 265-6
wound contamination with Pu, 396
Hydrobiotite, Cs sorption, 263
Hydrogen, explosive recombination with O in KEWB, 44
handling, 84-7
nucleate-boiling heat flux, 51
reaction with graphite, 48-9
Hydrology, NRTS, 111
siting of reactors and research centers, 27
waste disposal, 109-13

I

Idaho Chemical Processing Plant, waste disposal, 296, 300, 400
Illite, Cs sorption, 263-5
Incidents
See Accidents and Damage
Incineration, effluent cleaning, 252, 254
Inconel, gas effects on mechanical properties, 363
India, power-reactor siting, 22
Industry
See Atomic Industrial Forum, Gaseous diffusion plants, Power stations, Radiochemical plants, Reactors, and Research centers

Insects, radioisotope movement in White Oak Lake bed, 266-7
Insurance, 136, 216-17, 330-2
International Atomic Energy Agency, nuclear damage civil liability convention, 221-3
  siting symposium, 20-31
International Conference on Civil Liability for Nuclear Damage, 221-3
Iodides (alkyl), filtration, 253
Iodine-127, decontamination using, 260
  removal from DIDO and PLUTO containment vessels, 255-8
  sampling air for, in DIDO and PLUTO containment vessels, 256-8
Iodine-131, fallout data, 324-5
  filtration, 252-3
  human thyroid uptake through milk from pasture, 254
  release from Hanford fuel processing, 295
  release regulations, 283
Iodine-132, removal from DIDO and PLUTO containment vessels, 255-8
  sampling air for, in DIDO and PLUTO containment vessels, 256-8
Iodine radioisotopes, behavior, 252-61
  filtration, 28, 252-4, 256-8
  radiation exposure in U. K. and U. S., 31
  release from irradiated U and reactor fuels, 252
  sampling in Brookhaven reactor, 254
Ion-exchange processes, radiation level control in pressurized-water reactors, 47

K

Kaolinite, Cs sorption, 263, 265
Krypton radioisotopes, release from reactor fuels, 252, 359-60

L

Laboratories, design for handling Pu, 393-5
  I-isotope transport, 260
Liability, IAEA convention on nuclear damage civil, 221-3
  insurance, 136, 216-17, 330-2
Licensing and regulation, authority of states, 284
  Big Rock Point Reactor, 127-8, 207-8, 210, 278, 410, 413, 415
  Bodega Bay Nuclear Plant, 127-8, 130, 208, 210-11, 277-8, 413, 415
  BONUS Reactor, 128, 130, 208, 277-8, 413, 415
  BORAX-V, 128, 208, 278, 413
  by-product materials, 216-17, 284, 420
  Carolinas-Virginia Tube Reactor, 128, 130, 208, 211, 278, 413, 415
  changes, 135-6, 215-17, 283-4, 419-20
  Connecticut Yankee Reactor, 128, 208, 211, 277-8, 413, 415
  Dresden Reactor, 128, 131, 208, 211, 277-8, 280, 413, 415
  Elk River Reactor, 128, 131, 208, 211-12, 278, 280, 413, 415
  Enrico Fermi Atomic Power Station, 128, 131-2, 208, 212, 278, 280, 413
  Experimental Boiling-Water Reactor, 128, 208, 278, 413
  Experimental Breeder Reactor II, 128, 208, 278, 280, 413
  Experimental Gas-Cooled Reactor, 128, 208, 278, 413
  Hallam Nuclear Power Facility, 128, 208, 212, 278, 280, 413, 416
  Humboldt Bay Reactor, 128, 132, 208, 212, 278, 280-1, 413, 416
  Indian Point Reactor, 128, 132, 208, 212, 278, 281, 413, 416
  Jersey Central Reactor, 212, 414, 416
  La Crosse Reactor, 129, 132, 209, 279, 281, 414, 416
  Malibu Nuclear Plant, 129, 209, 212, 279, 414, 417
  materials, in Arkansas, 217
  New Production Reactor, 414, 417
  Niagara Mohawk Reactor, 212, 414, 417
  N.S. *Savannah*, 129, 133-4, 209, 213, 279, 281, 414, 417
  Pathfinder Reactor, 129, 209, 213-14, 279, 281, 414, 418
  Peach Bottom Reactor, 129, 134, 209, 279, 414
  Piqua Nuclear Power Facility, 129, 134, 209, 279, 281, 414, 418-19
  plutonium, 284
  power demonstration reactors, 284
  power reactors, 127-35, 207-15, 277-83, 410, 413-19
  production facilities, 136
  radiation protection standards, 283-4
  radiochemical plants, 212-13
  Ravenswood Reactor, 129, 209, 214, 279, 281
  reactor fuel-processing plant in Cattaraugus Co., N. Y., 133, 296-7
  reactor fuel shipment, 216
  San Onofre Nuclear Generating Station, 129, 209, 214, 279, 281-2, 414, 419
  Saxton Reactor, 129, 134, 209, 214, 279, 282, 414, 419
  Shippingport Pressurized-Water Reactor, 129, 209, 279, 414
  Sodium Reactor Experiment, 129, 209, 279, 414
  source material, 216-17, 420
  special nuclear materials, 216-17, 284
  utilization facilities, 136
  Vallecitos Boiling-Water Reactor, 129, 135, 209, 214-15, 279, 282, 419
  Vallecitos Experimental Superheat Reactor, 129, 135, 209, 215, 279, 282, 414
  Yankee Reactor, 129, 135, 209, 215, 279, 282-3, 414, 419
Lithium (molten), handling, 362
Lithium fluoride, use in thermoluminescent dosimeters, 195
Livermore, England, glove-box fire control, 90
Los Alamos Scientific Laboratory, Pu handling, 394-6
Loss-of-flow test, pressurized-water reactors, 255

M

Magnesia, reaction with graphite, 49
Magnesium, burning, 361-2
Mammals, Cs-isotope elimination, 266
  radioisotope movement in White Oak Lake bed, 266-7
Manganese ions, disposal from U milling, 288
Marine organisms, radioisotope uptake, 196-8
Martin Company, Pu handling, 394-6
Materials (by-product), licensing and regulation, 216-17, 284, 420
Materials (feed), waste disposal from processing plants, 290
Materials (organic), contamination of reactor-coolant, 294
Materials (radioactive), accidents in shipping, 123-7
  milling, 316-21
  mining, 316-21
  release regulations, 283-4
Materials (reactor pressure-vessel), 342-5
Materials (source), licensing and regulation, 216-17, 420
Materials (special nuclear), licensing and regulation, 216-17, 284
Merchant ships
  See Reactors (N.S. *Savannah*)
Metals, extinguishing of fires, 361-2
  reactions, with gases, 360-3
  with water, 51-4, 392
Metals (alkali)(molten), handling, 362-3
Meteorology, 253-4
  radioisotope diffusion in U. S., 184-92, 403-4
  reactor siting, 27-8
  research center siting, 27
Meters, personnel radiation, 196
Mexico, reactor siting, 23-4
  research center siting, 24
Mice, ^{137}Cs elimination, 266
Milling, disposal of U wastes, 288, 290
  radiation hazards in U, 288, 316-21
Minerals, sorption reactions of soil, with Cs, 262-5
Mining, radiation hazards in U, 288, 316-21
Missiles
  See Rockets (nuclear)
Monkeys, ^{137}Cs elimination, 266
Montmorillonite, Cs sorption, 263-5
Mutagens, 227-8

N

NaK, handling, 362
National Reactor Testing Station, fission-product movement in soil, 26
  groundwater movement, 111
  monitoring of radioactive effluents, 25-6
  siting, 25-6, 29
  tritium in fuel-processing waste, 400
  Waste Calcination Facility off-gas filtering, 251-2
Neptunium-239, decay-heat generation in reactor shutdown, 42
Netherlands, research-center siting, 23-4
Neutrons
  See Radiation (neutron)
New Jersey, regulatory authority, 284
Nickel, creep strength, H effects on, 363
  pool-boiling burnout, 49
Nickel alloys, mechanical properties, gas effects on, 363
Niobium, retention by sand, 262
  tensile properties, gas effects on, 363
Nitrate ions, disposal from U milling, 288
Nitrogen, nucleate-boiling heat flux, 51
  reaction with graphite, 48-9
Nitrogen radioisotopes, discharge from water-cooled reactors, 291
North Carolina, regulatory authority, 284
Nuclear explosions
  See also Explosions
  fallout in atmosphere, 95-104
  fission-product tracers, 102-4
Nuclear propulsion
  See Rockets (nuclear)
Nuclear Safety Pilot Plant, fission-product transport and suppression, 254-5
Nuclear ships
  See also Reactors (N.S. *Savannah*)
  port surveys, 321-3
Nuclear transducers, 168-9

O

Oak Ridge Gaseous Diffusion Plant, criticality monitoring, 169-72
Oak Ridge National Laboratory, disposal of Cs-containing wastes in shale, 262
  glove-box fire and explosion tests, 90
O'Neill, Nebraska, atmospheric diffusion, 403-7
Organisms, radioisotope uptake by aquatic, 196-8
Oxygen, explosive recombination with H in KEWB, 44
  nucleate-boiling heat flux, 51

P

Paducah Gaseous Diffusion Plant, criticality monitoring, 172
Particle accelerators
  See Accelerators
Particles
  See also Air, Atmosphere, and Fallout
  behavior of I-isotope-bearing, in containment vessels, 254-61
  filtering, 254
  hazards in mining, 288, 316-21
  I-vapor adsorption on, in reactors, 254
  release of radioactive, into ventilation systems, 252
Peat, Cs sorption, 263
Personnel
  See Human beings
Philippines, signing of IAEA nuclear damage civil liability convention, 222
Phosphorus-32, uptake from aquatic environments, 197
Physics (geo-), waste disposal, 111
Plastics, use in prefilters, 254
Platinum, pool-boiling burnout, 49-50
Plutonium, burning, 361
  criticality control, 395-6
  deposition in body, 379-80
  fire extinguishing, 362, 395
  handling, 392-6
  licensing, 284
  recovery-process control at Savannah River Plant, 69-75
Plutonium-239, decay-heat generation in reactor shutdown, 42
  monitoring in air, 194-5
Plutonium alloys, fire control, 395
Plutonium compounds, fire control, 395
Plutonium radioisotopes, deposition in body, 379-80
  formation, 378-9
  radiation dose rates, 380-2
  radiation monitoring of wounds for, 396
Poland, power-reactor siting, 22
Pollution
  See also Contamination
  atmospheric, time-space considerations, 190-2
Polyurethane, shock-absorbing properties, 182
Ports, surveys for nuclear ships, 321-3
Portsmouth Gaseous Diffusion Plant, criticality monitoring, 171-2
Potassium, relation to Cs in soil, 264-5
Potassium (molten), handling, 362
Potassium alloys
  See NaK
Power stations
  See also Reactors
  feasibility of coal-driven, 228-30
  health hazards, 327-30
Prefilters, plastic material use in, 254
Production facilities, licensing and regulation, 136
Propulsion
  See Rockets (nuclear)
Public Health Service, missile test range radiation monitoring, 315
Purex process, control at Savannah River Plant, 69-75
  filters at Hanford, 295
  tritium in waste at Hanford, 400

R

Rabbits, radioisotope body burdens in White Oak Lake bed, 267
Radiation
  See also Contamination, Federal Radiation Council, and Radioisotopes
  detection of, from failed reactor fuels, 63-4
  dose rates from Pu radioisotopes, 380-2
  exposure, 24-8, 31, 123, 380-2, 410
  genetic effects, 228
  hazards, 226-8, 325-32
    in reactor fuel processing, 378-9
    in space, 15-20
    in U milling and mining, 288, 316-21
  levels, in ORR after fuel-failure incident, 204-5
    in pressurized-water reactors, 45-7
    in Saxton reactor, 274
  Th, 385-7
  tolerances, 20-2
Radiation (alpha), monitoring of atmosphere, 194-5
Radiation (cosmic), hazards in space, 16-20
Radiation (electromagnetic), hazards in space, 15
Radiation (gamma), ^{233}U, 384
Radiation (neutron), detection, 168-9
  of delayed, from failed reactor fuels, 64
  flux mapping in Plum Brook Reactor Facility, 169
  heating rates of delayed, in reactor shutdown, 42
  personnel monitoring, 192-4
  ^{233}U, 385
Radiation (Van Allen), hazards, 17-20
Radiation detectors, calibration, 171
  development, 168
  use of whole-body, 266
Radiation dosimetry, 192-6
Radiation Emergencies Steering Committee, formation, 169
Radiation monitoring
  See also Filtration
  accelerators, 193-4
  gaseous diffusion plants, 169-72
  human beings, 192-6
  low-background, 195-6
  missile test ranges, 315
  reactor fuel-processing-plant waste effluent, 59-62
  reactors, 28, 168-9, 193
  research-center environs, 28
  wounds for Pu, 396
Radiation protection, clothing for, 104-9
  personnel in U mines, 288
  standards, 283-4
Radiation shielding, Saxton reactor, 274
Radioactive materials
  See Materials (radioactive)
Radioactive tracers, nuclear explosions, 102-4
Radioactivity, containment, 253
  determination of form in gas systems, 252
Radiobiology, radioisotope elimination, 265-7
Radiochemical plants, control of operations at Savannah River, 69-75
  licensing and regulation, 212-13
Radioisotopes
  See also Contamination, Fission products, Materials, and Systems for Nuclear Auxiliary Power
  atmospheric diffusion in U. S., 184-92
  biological elimination, 265-7
  crud in pressurized-water reactors, 45-6
  movement, along food chains in White Oak Lake bed, 266-7
    through ground, 109-13
  release consequences, 95-113, 184-98, 262-7
  uptake from aquatic environments, 196-8
Radium, mining hazards, 317
  release regulations, 283
  removal from U-mining wastes, 288, 290
Radon, U-mining hazards, 288, 317-20
Ramjets (nuclear), detection of fission products from, 64
  space propulsion, 313-14
Rare earths, retention by sand, 262
Rats, ^{137}Cs elimination, 266
  radioisotope body burdens in White Oak Lake bed, 267
Reactor Centrum Nederland, siting, 24
Reactor containment vessels, 10-12, 27-8, 75-84, 253
  breakup during runaway, 175-6
  economics, 140-2, 144-5
  I-radioisotope behavior in, 254-61
  materials, 342-5
  safety assessment of N.S. *Savannah*, 146-7
  structural integrity, 175-82
Reactor control, Xe instability, 351-4
Reactor coolants, contamination, 291-2, 294
  handling of liquid alkali metal, 362-3
  heat flux of polyphenyl, 159
  loss of flow in pressurized-water reactors, 255
  vaporization of Na, in fast reactors, 238
Reactor cooling systems, failure, 140-2
  pressure surges in channels of fast, 238
Reactor cores, transient testing in SPERT, 151-3
Reactor fuel-processing plants, Cattaraugus Co., N. Y., 133, 212-13, 296-8
  control at Savannah River, 69-75
  siting, 402-3
  waste disposal, 59-62, 290, 294-8, 300-1, 399-403
Reactor fuels, bending in EBR-I, 355
  energy release from molten U in fast, 236-7
  failure detection, 63-4
  fission-product release from, 252, 359-60
  manufacture, waste disposal from, 290-1
  meltdown experiments in TREAT, 234-8
  oxidation, 236
  safety-rod applications of fused, 373
  shipment, 123-7, 201-2, 216
Reactor fuels (Al-U alloy), transient testing in SPERT, 151-3
Reactor fuels (BeO)(irradiated), integrity, 340-1
Reactor fuels (ceramic)(irradiated), integrity, 338-42
Reactor fuels (fissium-U alloy)(gas-bonded)(irradiated), meltdown in TREAT, 235-6
Reactor fuels (fissium-U alloy)(Na-bonded)(irradiated), transient testing in TREAT, 236
Reactor fuels (graphite dispersion)(irradiated), integrity, 341
Reactor fuels (Mo-U alloy)(Zr-clad), transient testing in TREAT, 236
Reactor fuels (Mo-U alloy)(Zr-clad)(irradiated), transient testing in TREAT, 236
Reactor fuels (^{239}Pu), reprocessing, radiation hazards of, 378-82
Reactor fuels (Pu carbide)(irradiated), integrity, 341
Reactor fuels (Pu oxide)(irradiated), integrity, 340
Reactor fuels (Th-^{233}U), reprocessing, radiation hazards of, 382-9
Reactor fuels (U), energy release from molten, 236-7
Reactor fuels (UC)(irradiated), failure, 234, 341
Reactor fuels (U nitride)(irradiated), integrity, 340
Reactor fuels (UO_2), heat-transfer aspects of meltdown, 236
  transient testing in SPERT-I, 231-4
Reactor fuels (UO_2)(gas-bonded), meltdown in TREAT, 234
Reactor fuels (UO_2)(gas-bonded)(irradiated), meltdown in TREAT, 234
Reactor fuels (UO_2)(irradiated), integrity, 339-40
Reactor fuels (UO_2)(S.S. 304-clad), failure, 234-5, 339-40
Reactor fuels (UO_2)(Zircaloy-clad)(irradiated), failure, 339

Reactor fuels (UO_2-ZrO_2)(irradiated), integrity, 340
Reactor fuels (US)(Ta-clad), transient testing in TREAT, 236
Reactor fuses, development, 372-4
Reactor in-pile loops, hazards of EGCR, 84-5
instrument-system testing, 374-6
Reactor operators, training and licensing of Saxton, 273-4
Reactors, 136-7, 420-2
See also Power stations, Rockets (nuclear), and Systems for Nuclear Auxiliary Power
burnout, 49-51, 157-65
Doppler coefficients, 65
economics of safeguards, 139-45
environmental radiological monitoring, 28
exhaust systems, 141
filters, 141
fission-product release, 24-8, 389-92
H hazards, 86
instability, 157
kinetics, 155-7
poison injection, 65
radiation monitoring, 28, 168-9, 193
safety features, engineere ., 27-9
safety-research-program review, 200-1
safety-system failure, 172-3
scaling-procedure validity, 176-81
self-shutdown, 64-7
shutdown heat generation, 40-2
siting, 142, 145, 223-6
space propulsion, 303-16
stack-gas-inhalation radiation dosage, 28
stacks, 141
supply system costs, emergency, 139-40, 145
transmission line costs, 142, 144-5
waste disposal, 27-8, 291-4
Reactors (Advanced Gas-Cooled), accidents, 2-7
containment, 10-11, 343
Reactors (Agesta), siting, 22-3
Reactors (Alize I), safety-system failure, 172-3
Reactors (aqueous homogeneous), containment costs, 142-4
Reactors (Ardennes Nuclear Power Station), electric-power-system control and instrumentation, 243
Reactors (Big Rock Point), control by digital computer, 62-3
licensing and regulation, 127-8, 207-8, 210, 278, 410, 413, 415
stability, 355
Reactors (Bodega Bay), containment, 77
licensing and regulation, 127-8, 130, 208, 210-11, 277-8, 413, 415
Reactors (Boiling Nuclear Superheater), containment costs, 144
licensing and regulation, 128, 130, 208, 277-8, 413, 415
Reactors (Boiling Reactor Experiments), fission-product release from IV, 391-2
licensing and regulation of V, 128, 208, 278, 413
reactivity changes, 2
Reactors (boiling-water), containment, 77-8 81, 83-4, 141-5
stability, 355
transmission line costs, 144-5
Reactors (BR-1), graphite annealing, 337-8
Reactors (Brookhaven), I sampling, 254
Reactors (Calder Hall B Nuclear Power Station), electric-power-system control and instrumentation, 247-8
Reactors (CANDU), control, 62-3, 352
Reactors (Carolinas-Virginia Tube), licensing and regulation, 128, 130, 208, 211, 278, 413, 415
Reactors (CEGB), Xe instability control, 353-4
Reactors (Chinon Nuclear Power Stations), electric-power-system control and instrumentation, 243-4
siting, 23
Reactors (Connecticut Yankee), licensing and regulation, 128, 208, 211, 277-8, 413, 415
siting, 223
Reactors (DIDO), I-radioisotope behavior in containment vessel, 255-8
Reactors (Douglas Point), electric-power-system control and instrumentation, 240-2
Reactors (Dounreay fast), containment, 11
coolant-loss accidents, 8
Reactors (Dragon), containment, 10-11, 76-7, 81, 83
Reactors (Dresden), in-core monitoring, 169
licensing and regulation, 128, 131, 208, 211, 277-8, 280, 413, 415
Reactors (EDF-1, 2, and 3), electric-power-system control and instrumentation, 243-4
Reactors (EDF-3), pressure vessel, 343-4
Reactors (EL-3), fission-product release, 390
metal-water reaction, 392
Reactors (Elk River), containment costs, 144
licensing and regulation, 128, 131, 208, 211-12, 278, 280, 413, 415
Reactors (Engineering Test), fission-product release, 391
Reactors (Enrico Fermi), containment penetrations, 10-11
fuel transient testing in TREAT, 236
licensing and regulation, 128, 131-2, 208, 212, 278, 280, 413
Reactors (Experimental Boiling-Water), containment costs, 140-1
licensing and regulation, 128, 208, 278, 413
radiation levels in, 46
startup transients, 156
Reactors (Experimental Breeder I), fuel rod bending, 355
Reactors (Experimental Breeder II), containment costs, 144
fuel failure, 234-7
licensing and regulation, 128, 208, 278, 280, 413
pressure surge from Na vaporization, 238
Reactors (Experimental Breeder II Mark I), fuel testing in TREAT, 235-6
Reactors (Experimental Gas-Cooled), containment costs, 144
fuel failure, 339-40
graphite oxidation, 48
hazards of in-pile loop, 84-5
I-radioisotope concentration in containment volume in maximum credible accident, 255
licensing and regulation, 128, 208, 278, 413
Reactors (Experimental Organic-Cooled), dynamics, 156-7
stability, 355
Reactors (fast), accidents, 7-9, 12
energy release from molten U, 236-7
fuel meltdown in TREAT, 234
pressure surges in coolant channels, 238
Reactors (fast-breeder), containment costs, 142-4
Reactors (fog-cooled), fluid dynamics and heat transfer, 164
Reactors (G1), fire, 361
fission-product release, 390
Reactors (G2 and G3), pressure vessels, 343
Reactors (Garigliano Nuclear Power Station), electric-power-system control and instrumentation, 245-6
Reactors (gas-cooled), accidents, 2-7, 12
containment, 142-4
coolant contamination, 292, 294
cooling, emergency, 48
failed fuel detector in French, 64
H hazards, 84-5
siting, 29
Reactors (Godiva), low-source startup kinetics, 156
Reactors (graphite-moderated), containment costs, 142-4
graphite chemical reactions, 47-9
reactivity accidents, 2
Wigner energy release, 336-8
Xe instability control, 352
Reactors (Gundremmingen Nuclear Power Station), electric-power-system control and instrumentation, 245
Reactors (Halden Boiling-Water), containment costs, 141
reactivity coefficients, 156
Reactors (Hallam), containment costs, 144
fuel meltdown in TREAT, 234
licensing and regulation, 128, 208, 212, 278, 280, 413, 416
Reactors (Hanford Production), containment, 78, 253
Xe instability, 346
Reactors (Heat-Transfer Experiment No. 3), safety-system failure, 172
Reactors (Heavy-Water Components Test), containment, 144, 253
fuel-failure detection, 64
Reactors (heavy-water-moderated), containment costs, 142-4
Reactors (Humboldt Bay), containment, 77-8
licensing and regulation, 128, 132, 208, 212, 278, 280-1, 413, 416
Reactors (Indian Point), licensing and regulation, 128, 132, 208, 212, 278, 281, 413, 416
Reactors (Jersey Central), licensing and regulation, 212, 414, 416
Reactors (Jülich Nuclear Power Station), electric-power-system control and instrumentation, 244
Reactors (Kahl Nuclear Power Station), electric-power-system control and instrumentation, 244-5
Reactors (Kinetic Experiments on Water Boilers), program review, 42-5
Reactors (KIWI), H explosion, 84
space propulsion development, 309-12, 314
Reactors (La Crosse), licensing and regulation, 129, 132, 209, 279, 281, 414, 416
Reactors (Latina Nuclear Power Station), electric-power-system control and instrumentation, 246
Reactors (liquid-metal-cooled), coolant contamination, 292
Reactors (LOFT), industrial interest, 202-3
Reactors (Low-Intensity Test), in-pile loop safety, 375
Reactors (low-power), siting, 23
Reactors (Lucens), containment, 79-80
Reactors (Magnox), accidents, 2-7
Reactors (Malibu), containment, 75, 83-4
licensing and regulation, 129, 209, 212, 279, 414, 417
siting, 223
Reactors (Materials Testing), fission-product release, 391
Reactors (medium-power), siting, 23
Reactors (Mobile Low-Power Plant No. 1), stability, 356
Reactors (Molten-Salt Reactor Experiment), stability, 356
transient analysis using digital computer, 157
Reactors (NERVA), development for space propulsion, 309-14
Reactors (New Production), licensing and regulation, 414, 417
Reactors (Niagara Mohawk), licensing and regulation, 212, 414, 417
Reactors (NRU), emergency waste disposal, 300
fission-product release, 390
metal-water reaction, 392
Reactors (NRX), emergency waste disposal, 300
fission-product release, 390
metal-water reaction, 392
testing, 309-10
Reactors (N.S. *Savannah*), 146-9
air-cleaning system, 146-7
containment, 28, 75, 81, 83, 146-7, 253

Reactors (N.S. *Savannah*) (Continued)
I-radioisotope concentration in containment volume in maximum credible accident, 255
licensing and regulation, 129, 133-4, 209, 213, 279, 281, 414, 417
mobility, 147-8
operation, 146-9
port surveys, 321-3
siting, 30, 223
Reactors (Nuclear Power Demonstration Station), electric-power-system control and instrumentation, 242-3
Reactors (Oak Ridge Graphite), fission-product release, 390
graphite annealing, 338
waste disposal, 294
Reactors (Oak Ridge Research), containment, 11, 78, 141-2
fission-product release, 204-5, 391
fuel failure, 203-7
in-pile loop safety, 375-6
Milletron testing, 356
operation through 1962, 116-23
Reactors (Oldbury), pressure vessel, 343-4
Reactors (organic-cooled), waste disposal, 294
Reactors (Organic-Moderated Reactor Experiment), fission-product release, 391
Reactors (Pathfinder), containment costs, 144
licensing and regulation, 129, 209, 213-14, 279, 281, 414, 418
Reactors (Peach Bottom), fuel radiation stability, 341
licensing and regulation, 129, 134, 209, 279, 414
Reactors (Piqua), containment costs, 144
licensing and regulation, 129, 134, 209, 279, 281, 414, 418-19
Reactors (Plum Brook), neutron flux mapping, 169
Reactors (PLUTO), I-radioisotope behavior in containment vessel, 255-60
Reactors (Portable Medium-Power Plant No. 1), burnout, 159
pressure vessel, 343
Reactors (Portable Medium-Power Plant No. 2A), pressure vessel, 344
Reactors (power), 1-13
accidents, 1-2
containment, 10-12, 80-1, 83-4
control by digital computer, 62-3
electric-power-system control and instrumentation of foreign, 240-9
health hazards, 329-30
licensing and regulation, 127-35, 207-15, 277-83, 410, 413-19
self-shutdown, 64-7
siting, 21-3, 30-1, 223-6
stability, 354-6
Reactors (Power Burst Facility), industrial interest, 203
Reactors (power demonstration), licensing exemption, 284
Reactors (pressurized-water), 12
boiling detection, 372
containment costs, 141-4
coolant loss of flow, 255
fission-product release studies at HAPO, 255
radioactivity in, 45-7
system testing in SPERT-III, 154
Reactors (Ravenswood), containment, 75-6
licensing and regulation, 129, 209, 214, 279, 281
siting, 225-6
Reactors (research), self-shutdown, 64-7
siting, 23-4
Reactors (RIFT), space propulsion development, 309-10, 312-14
Reactors (Rover type), space propulsion development, 310-12
Reactors (San Onofre), licensing and regulation, 129, 209, 214, 279, 281-2, 414, 419
Reactors (Savannah River Production), containment, 253
Xe instability, 346
Reactors (Saxton), licensing and regulation, 129, 134, 209, 214, 279, 282, 414, 419
operating experience, 269-77
Reactors (Shippingport Pressurized-Water), fuel failure, 64, 339
licensing and regulation, 129, 209, 279, 414
radiation levels in, 46
Xe instability, 346-7
Reactors (Simevarp Nuclear Power Station), electric-power-system control and instrumentation, 246-7
Reactors (sodium-cooled), accidents, 8-9
containment, 142-4
Reactors (Sodium Reactor Experiment), fission-product release, 391
licensing and regulation, 129, 209, 279, 414
stability, 355-6
Reactors (Special Power Excursion Reactor Test), industrial interest, 202-3
program status report, 151-5
reactivity change, 2
self-shutdown, 65-6
Reactors (Special Power Excursion Reactor Test I), destructive test with UO_2 fuel, 231-4
fission-product release, 26, 391
transient testing, 151-3
Reactors (Special Power Excursion Reactor Test II), transient testing, 153
Reactors (Special Power Excursion Reactor Test III), pressurizer vessel failure, 154
Reactors (Special Power Excursion Reactor Test IV), transient testing, 154-5
Reactors (Stationary Low-Power Plant No. 1), fission-product release, 26, 391
metal-water reactions, 54, 392
safety system, 173
waste disposal following incident, 300
Reactors (swimming pool), siting, 23
transient testing using SPERT-IV, 154-5
Reactors (thermal), Xe instability, 345-54
Reactors (Tokai Nuclear Power Station), electric-power-system control and instrumentation, 248
Reactors (Transient Reactor Test Facility), fuel-element meltdown experiments, 234-8
industrial interest, 203
metal-water reactions, 52
Reactors (TRIGA), transient behavior, 65
Reactors (Vallecitos Boiling-Water), licensing and regulation, 129, 135, 209, 214-15, 279, 282, 419
Reactors (Vallecitos Experimental Superheat), licensing and regulation, 129, 135, 209, 215, 279, 282, 414
Reactors (Vincha), in-core monitoring, 169
Reactors (water-cooled), accidents, 2, 9-10
bubble formation, 66-7
containment, 11, 27-9
cooling-system failure, 140
fuel-failure detection, 64
metal-water reactions, 51-4
siting, 29
waste disposal, 291-2
Reactors (water-moderated), accidents, 2, 9-10
bubble formation, 66-7
containment, 11, 27-8
fuse, 373-4
self-shutdown, 65-6
Reactors (Westinghouse Testing), fission-product release, 391
Reactors (Windscale Advanced Gas-Cooled), electric-power-system control and instrumentation, 248
Reactors (Windscale No. 1), fission-product release, 390, 392
Reactors (Yankee), containment, 76, 144
I-radioisotope concentration in containment volume in maximum credible accident, 255
licensing and regulation, 129, 135, 209, 215, 279, 282-3, 414, 419
stability, 356
Reactors (Zenith), deposited I-isotope release in containment vessel, 258
Redox plant, waste disposal, 300, 400
Refractory oxides, reactions with graphite, 49
Regulation
See Licensing and regulation
Reports, safeguards, 136-7, 420-2
Research centers, 20-31
Respiratory protection equipment, 107-9
Rhodium-102, tracing of nuclear explosions, 103-4
Rockets (nuclear), detection of fission products from, 64
space propulsion, 303-16
Rockets (Rover), H handling, 84
Rubber (sponge), shock-absorbing properties, 181-2
Rubidium (molten), handling, 362
Rubidium-86, elimination from mammals, 266
Rubidium-88, release in ORR fuel-failure incident, 205
Ruthenium-106, body burdens in mammals in White Oak Lake bed, 267

S

Safeguards reports, 136-7, 420-2
Sampling
See Radiation monitoring
Sand, waste disposal in, 262-3
Saturn C-5, explosion, 314
Savannah River Plant, control of radiochemical operations, 69-75
waste disposal from fuel processing, 296, 300-1, 400
Semiconductors, neutron detection using, 168-9
Shale, disposal of Cs-containing wastes into, 262
Shielding, Saxton Reactor, 274
Shipping, accidents, 123-7
casks, 201-2
regulations, 216
Silver, pool-boiling burnout, 49
Siting, fuel-processing plants, 402-3
nuclear research centers, 23-4, 27
reactors, 20-31, 142, 145, 223-6
Snails, ^{65}Zn elimination, 267
Sodium, contamination of reactor-coolant, 292
Sodium (molten), handling, 362-3
vaporization in fast reactors, 238
Sodium-22, elimination from mammals, 266
Sodium alloys
See NaK
Sodium chloride aerosol, development and application, 254
Soil, Cs relation to K, 264-5
radioisotope movement through, 26, 109-13
sorption reactions of minerals with Cs, 262-5
tritium movement in systems with water, 400-2
Source material, licensing and regulation, 216-17, 420
Space, propulsion systems, 303-16
radiation hazards, 15-20
Space Nuclear Propulsion Office, safety investigation program, 311-12
Spain, signing of IAEA nuclear damage civil liability convention, 222
Special nuclear materials, licensing, 216-17, 284

Specifications, white rooms, 254
Spectrometers, reactor fuel-failure detection, 64
Spinel, reaction with graphite, 49
Sponge rubber, shock-absorbing properties, 181-2
Stack gases, radiation monitoring of processing plant, 59-62
Stainless steel, pool-boiling burnout, 49-50
  reaction with water, 51, 53-4
  reactor pressure vessels, 343
Stainless steel (304), creep strength, gas effects on, 363
Stanford Research Institute, reactor breakup during runaway, 175-6
Steam, reaction with graphite, 48-9
Steels, crud release of C, 47
  reactor pressure vessels, 342-5
  ultimate and yield stress, 180
Stratosphere
    See also Air, Atmosphere, and Particles behavior, 95-7
Strontium, biological elimination, 266
  uptake by aquatic organisms, 198
Strontium-89, release regulations, 283
Strontium-90, body burdens in mammals in White Oak Lake bed, 267
  fallout data, 323, 325
  filtration, 252-3
  migration in sand, 262
  release regulations, 283
  uptake from aquatic environments, 197-8
Sweden, reactor siting, 22-4
  research-center siting, 23-4
Systems for Nuclear Auxiliary Power, evaluation, 303-6
  radioisotopic space generators, 308-9, 316
  reactor space generators, 306-8, 315-16

T

Tellurium-132, filtration, 252-3
Tellurium radioisotopes, release from reactor fuels, 252
Tennessee, regulatory authority, 284
Thoria, reaction with graphite, 49
Thorium, decay, 383-4
  radiation, 385-7
Thorium ores, mining hazards, 317
Thorium radioisotopes, generation, 383-4
Thyroid, ^{131}I uptake by human beings through milk from pasture, 254
Titania, reaction with graphite, 49
Toxicology
    See also Health
  Be, 31-6
  Pu, 393
Tracers (radioactive), nuclear explosions, 102-4
Transducers (nuclear), 168-9
Transmission lines, economics for reactors, 142, 144-5
Transuranic elements, spontaneous fission heat generation in reactor shutdown, 42
Transuranium Processing Plant, containment and ventilation systems, 251
Tritium, determination, 402
  in fuel-processing waste, 399-403
  movement in soil-water systems, 400-2
Troposphere
    See also Air, Atmosphere, and Particles behavior, 95-7
  fallout, 101-2
Tubes, burnout, 159, 161-2
  heat-transfer deterioration during boiling in, 163-4
Tungsten-185, tracing of nuclear explosions, 103

U

Ultrasonic vibration, effect on reactor burnout, 160
United Kingdom, aerosol research, 254
  I-radioisotope radiation exposure, 31
  nuclear facility siting, 21-2, 29, 31
United Nations, signing of IAEA nuclear damage civil liability convention, 222
United States, atmospheric diffusion, 184-92, 403-6
  I-radioisotope radiation exposure, 31
  nuclear facility siting, 29-31
  objections to IAEA nuclear damage civil liability convention, 222-3
Uranium, burning, 361, 395
  fire extinguishing, 362
  reaction with water, 51, 53-4
Uranium (irradiated), fission-product release, 252
Uranium-233, decay, 383-4
  fission yield in reactor shutdown, 42
  gamma activity, 384
  generation, 383-4
  neutron activity, 385
Uranium-235, fission yield in reactor shutdown, 42
  recovery-process control at Savannah River Plant, 69-75
Uranium-239, decay-heat generation in reactor shutdown, 42
Uranium carbide, fire extinguishing, 362
  ignition, 361
Uranium dioxide (irradiated), fission-product release, 356-60
Uranium ore, processing wastes, disposal of, 288-90
  radiation hazards, 288, 316-21
Uranium-zirconium alloys, reactions with water, 53-4
Utilization facilities, licensing and regulation, 136

V

Van Allen radiation
    See Radiation (Van Allen)
Van de Graaf generators, siting, 24
Vandenberg AFB, California, atmospheric diffusion, 403-4, 406
Ventilation, evaluation using computer, 251
  glove boxes, 88
  milling and mining, 316-21
  radioactive material release into, 252
  Transuranium Processing Plant, 251
Vermiculite, Cs sorption, 263-5
Vibration, effect of ultrasonic, on reactor burnout, 160

W

Waste Calcination Facility, off-gas filtering at NRTS, 251-2
Waste disposal, 287-301, 332
  accidents, 298, 300
  gases, 253-4
  nuclear facility siting, 27-8
  radioisotope movement through ground, 109-13
  Saxton reactor, 274-7
  sorption reactions of Cs with soil minerals, 262-5
  ^{90}Sr migration in sand, 262
Waste incinerators, off-gas system, 252
Wastes, radiation monitoring of processing plant, 59-62
  sources, 288-98
  tritium in, 399-403
Water, contamination of reactor-coolant, 291-2
  discharge of high-temperature, from reactors, 28
  movement of ground, at NRTS, 111
  radiation monitoring of processing-plant effluent, 59-62
  reactions with metals, 51-4, 392
  tritium movement in systems with soil, 400-2
White Oak Lake bed, radioisotope movement along food chains, 266-7
White rooms, specifications, 254
  Wigner energy release, 336-8
Wind, speed tabulation, 184-5
Wounds, radiation monitoring for Pu, 396

X

Xenon, instability in thermal reactors, 345-54
  release of radioisotopes from reactor fuels, 252, 359-60

Y

Yugoslavia, signing of IAEA nuclear damage civil liability convention, 222

Z

Zinc-65, biological elimination, 266-7
Zircaloy, pool-boiling burnout, 50
  reaction with water, 53-4
Zirconium, burning, 361
  reaction with water, 51-4
  retention by sand, 262